

REMARKS/ARGUMENTS

Claims 1-27 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

Claims 1, 3, and 25 stand rejected under 35 U.S.C. 102(e) as being anticipated by Gambino; claims 12, 13, and 27 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Gambino in view of Guo; claims 2, 17, and 19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Gambino, and Gambino in view of Guo, as applied to claims 1 and 12, and further in view of Yeo; claims 4-6, 14, and 15 stand rejected under 35 U.S.C. 103(a) as being anticipated by Gambino, and Gambino in view of Guo, in case of claims 14 and 15, as applied to claims 1 and 12, and further in view of Jeng; claims 7 and 16 stand rejected under 35 U.S.C. 103(a) as being anticipated by Gambino, and Gambino in view of Guo, in case of claim 16, as applied to claims 1 and 12, and further in view of Hong.

Independent claim 1 and 12 were both amended to include the limitations of depositing an oxide material comprising at least one of the group consisting of AlO_3 , ZrO_2 , HfO_2 (AlHf) O_x , HfO_2 , La_2O_3 , Y_2O_3 , silicon oxynitride, and hafnium silicon oxynitride substantially on the top surface of the gate, as well as over the semiconductor substrate, the opposing side surfaces of the gate being substantially free of the oxide material. In addition to amending claims 1 and 12 to include the limitations of the now canceled claims 7 and 16 respectively, SiO_2 was removed from the group of materials from which the oxide material can be formed. As described on page 9, lines 22-31, the forming the oxide material that comprises AlO_3 , ZrO_2 , HfO_2 (AlHf) O_x , HfO_2 , La_2O_3 , Y_2O_3 , silicon oxynitride, or hafnium silicon oxynitride results in an accumulation layer which can potentially increase carrier concentration, reduce external resistance, increase drive current, and device speed of the gate structure. The use of an oxide material that comprises AlO_3 , ZrO_2 , HfO_2 (AlHf) O_x , HfO_2 , La_2O_3 , Y_2O_3 , silicon oxynitride, or hafnium silicon oxynitride is not disclosed in any of the cited references and claims 1 and 12 are allowable over the cited references under 35 U.S.C. 102.

Furthermore there is nothing in any of the cited references that would render the oxide materials comprising AlO_3 , ZrO_2 , HfO_2 (AlHf) O_x , HfO_2 , La_2O_3 , Y_2O_3 , silicon oxynitride, or hafnium silicon oxynitride obvious and claims 1 and 12 are also allowable over the cited references under 35 U.S.C. 103.

Claim 1 further comprises the limitation of forming spacers on the opposing side surfaces of the gate subsequent to depositing said oxide material, the spacers contacting the opposing side surfaces of the gate substantially along the opposing side surfaces. As shown in Figure 2 of the Gambino reference the sidewall structures (labeled thick oxide spacer in the Fig.) are formed prior to the formation of any oxide material. This limitation is therefore not disclosed in the Gambino reference and claim 1 is further allowable over the Gambino reference under 35 U.S.C. 102. This limitation of forming spacers on the opposing side surfaces of the gate subsequent to depositing said oxide material is not disclosed in any of the cited references and claim 1 is further allowable over the cited references under 35 U.S.C. 102 and 35 U.S.C. 103.

Claims 2, 4, 6, 8-11, 24 and 25 depend on claim 1 and therefore contain all the limitations of claim 1. Claims 2, 4, 6, 8-11, 24 and 25 are therefore also allowable over the cited prior art.

Claims 12 further comprises the limitation of forming a nitride layer over the gate and the oxide material; and etching the nitride layer to form nitride spacers on the opposing side surfaces of the gate, the nitride spacers contacting the opposing side surfaces of the gate substantially along the opposing side surfaces. As described above the Gambino reference discloses forming the sidewall structures prior to the forming of any oxide material over the gate and substrate. This limitation of claim 12 is therefore not taught in the Gambino reference and claim 12 is allowable over the Gambino reference under 35 U.S.C. 102. Because the Gambino teaches away from the above claimed limitation by disclosing forming the sidewall structures before forming the oxide material, the Gambino reference cannot be properly combined with any of the other cited references to reject claim 12 under 35 U.S.C. 103.

Claims 13, 14, 15, 18 and 19 depend on claim 12 and therefore contain all the limitations of claim 12. Claims 13, 14, 15, 18 and 19 are therefore also allowable over the cited art.

In light of the above, it is respectfully submitted that the present application is in condition for allowance, and notice to that effect is respectfully requested.

While it is believed that the instant response places the application in condition for allowance, should the Examiner have any further comments or suggestions, it is respectfully requested that the Examiner contact the undersigned in order to expeditiously resolve any outstanding issues.

To the extent necessary, Applicants petition for an Extension of Time under 37 CFR 1.136. Please charge any fees in connection with the filing of this paper, including extension of time fees, to the deposit account of Texas Instruments Incorporated, Account No. 20-0668.

Respectfully submitted,

/Peter K. McLarty/

Peter K. McLarty
Attorney for Applicants
Reg. No. 44,923

Texas Instruments Incorporated
P.O. Box 655474, MS 3999
Dallas, TX 75265
(972) 917-4258